

**Title:** The Vulnerability of the Energy Sector in Costa Rica

**Contact(s):** Name: Stephen Bender  
Agency: OAS, USDE  
1889 F Street  
Washington, D.C. 20006  
Phone: (202) 458-3005  
Fax: (202) 458-3560  
E-mail: sbender@oas.org

**Hazards examined:** Earthquakes, floods, volcanic eruptions (emissions, earthquakes), drought and landslides

**Study emphasis:** Mitigation and disaster response.

**Summary:** Offers an estimation of the cost of repair to damaged and/or destroyed structures, the costs for the provision of replacement energy, the costs of lost production (hours of labor lost) and exports.

---

**Vulnerability Indicators:** Impact (major or minor) by hazard type (earthquake, flood, volcanic eruption (emissions, quake) drought, landslides) to energy sector infrastructure with estimated direct and secondary losses by energy type.

**Economic Development, Disaster Preparedness, Disaster Response and/or Disaster Reconstruction Application:** Investment in vulnerability reduction, planning event impact response.

**Data Requirements:** Inventory of all energy sector infrastructure components and associated roads segments and seaports; hazard zonation maps, damage assessments from previous events, current sector infrastructure and operations costs.

**Output:**

1. Cost of repair of damaged/destroyed infrastructure
2. Cost for the provision of replacement energy
3. Cost of lost production
4. Cost of lost exports
5. Hours of labor (work) lost

**Results of Application at Case Study Site:** At the time (immediately prior to the May 1991 earthquake) senior sector management (national and international) showed no interest in vulnerability reduction. Subsequent to the earthquake, at their own initiative, technical personnel formulated and received support in (a) purchasing and pre-positioning replacement equipment for essential vulnerable infrastructure, (b) preparing and implementing a disaster preparedness plan for the metropolitan area of San Jose, (c)

introducing the issue of redundancy in electrical grid development plans.

**Lessons Learned:**

1. As a last resort, governments and senior sector officials will focus on vulnerability issues following a disaster.
2. Capable, enthusiastic technical personnel when properly prepared can force initiatives at opportune moments and gain support.
3. Financial and economic benefits may occur, even in the short to medium term by investing in vulnerability reduction.